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Implementation study of an intermediate medication review in Belgian community pharmacies

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ABSTRACT

Background: The Association of Pharmacists in Belgium (APB) and local pharmacy associations launched a pilot project in collaboration with research teams from three Belgian universities to study the impact and implementation-related issues of a medication review (MR) service type 2a in Belgian community pharmacies.
Objective: The aim of this paper is to describe the implementation process of the MR service and to present the implementation evaluation of the pilot study (testing stage).
Methods: The pilot project was a prospective observational study using mixed methods. The implementation evaluation was based on the RE-AIM model and the framework for the implementation of services in pharmacy (FISpH). Collected implementation outcomes were classified into four dimensions: reach, adoption, implementation and intent of maintenance.
Results: During the testing stage, 80 pharmacies participated in the study, but 25 dropped out (31%), mainly because of a reported lack of time (adoption). The 55 remaining pharmacies included 457 patients. Recruiting patients into the service was challenging for pharmacists as 48.5% of patients refused the pharmacists' proposal (reach). Internal organizational factors were major barriers for pharmacists, followed by the lack of adoption by the pharmacy team. Large pharmacies in which pharmacy owner led the project were observed to be more proactive in implementing the MR service by integrating organizational strategies to assist the implementation process (implementation). Interviewed pharmacists perceived this new service as a professionally satisfying activity. Among participating pharmacists, 92.5% found this service feasible in practice, but believed it required adapted resources to reorganize the internal pharmacy workload, additional support, such as broad-based media campaigns to increase physicians' and patients' awareness and attitudes towards the service, and modified software (maintenance).
Conclusions: The medication review service was implemented in 68% of participating pilot Belgian community pharmacies but would require adapted resources and supports for larger scale implementation.

Introduction

In Belgium, the concept of pharmaceutical care was introduced in the modified Royal Decree of the 1st of May 2006 and then defined more in details in 2009 by the good pharmaceutical practice guidelines. In the latter, pharmacists are recognized as pharmaceutical caregivers responsible for continuously improving drug use and maintaining or improving patient quality of life, including prevention, identification and resolution of DRPs.[1,2] The two related royal decrees were coordinated on the 10th of May 2015 with the law regarding the exercise of health care professions.[3] These changes were a first step in the evolution of the pharmacist's role, which became a patient-centred approach. Since April 2010, a new remuneration system has been implemented in Belgium that includes a base fee covering basic

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pharmaceutical care delivered by pharmacists, fixed at 4.27 EUR per prescribed drug. Specific pharmacy services are starting to be developed in practice. Remuneration of pharmacists for these services is supported by the National Institute for Health and Disability Insurance and, therefore, are free of charge for patients.[4] The first Belgian remunerated service, the new medicines service for asthma patients with a first prescription for a corticosteroid inhaler treatment, was introduced in October 2013. Despite the availability of this new remunerated service, it appeared that the service was poorly provided in practice and that the allocated budget by the authorities was underemployed. The fidelity assessment also revealed poor communication around this new service and a lack of engagement from pharmacists, other health care professionals, and patients.[5]

Implementation quality of new pharmaceutical services has often been poorly studied, and their impact on professional practices has remained limited around the world.[6] In the field of health care, it is important to differentiate the evaluation of the intervention effectiveness (related to patient outcomes) and its implementation analysis in practice.[7] Implementation science is defined as "the study of methods to promote the adoption and the integration of evidence-based practices, interventions and policies into routine health care and public health settings."[8] Therefore, implementation science focuses on processes, impact (including barriers, facilitators, strategies and evaluations), and outcomes of implementation of a new service in practice.[9] Implementation science has increased in the past few years and implementation studies of new pharmaceutical services have begun to emerge in the literature and started to become recognized as essential to ensure their good delivery and, therefore, their effectiveness.[9,10] Poor implementation of new pharmaceutical services is not confined to Belgium and remains a worldwide issue, mostly due to lack of time, lack of resources and lack of interprofessional collaboration.[9,11] However, other examples in the literature show that the implementation of community pharmacy services in practice is feasible if potential influencing factors are considered and anticipated on beforehand and implementation strategies are used.[12,13]

In Belgium, the legally established concept of pharmaceutical care includes the "prevention, identification and resolution of drug-related problems with other health care professionals," implying the possibility of a structured evaluation of the patient's medicines, called medication review (MR).[14] The MR service is being explored as a possible next step in the development of pharmaceutical care in Belgium, as it is a promising service to improve medication adherence and has shown a positive impact on patient clinical outcomes and drug-related problems (DRPs).[15,16] In some countries such as Switzerland, Australia, New Zealand, Canada, United Kingdom (UK) or United States of America (USA), a specific remuneration for this type of service exists.[17]

The new medicines service for Belgian asthma patients was launched without a testing phase or implementation consideration, resulting in poor implementation. Considering this implementation challenge, the Association of Pharmacists in Belgium ("Association Pharmaceutique Belge" - APB) decided to launch a pilot project in collaboration with local associations of pharmacists and with research teams from three universities to study the effectiveness of a MR service in Belgian community pharmacies and to investigate issues related to the implementation of this service. This pilot project was aligned as a hybrid type 2 design, as the Impact of a Medication use EvaluatioN by the cOmmunity pharmacist (SIMENON study) in elderly polymedicated patients and its implementation in practice were evaluated together.[18] The implementation evaluation was considered a secondary objective in order to collect data and develop strategies for future national implementation. The objective of this paper is to describe the implementation process of the MR service and to present the implementation evaluation of the pilot study (testing stage).

Methods

Description of the service

The pharmaceutical care network in Europe defined MR as "an evaluation of a patient's medicines with the aim of optimizing medicines use and improving health outcomes. This entails detecting drug-related problems and recommending interventions." The tested service was a MR of a "type 2a" level. The "type 2a" combines the medication history review with an interview with the patient and is described as an intermediate MR as it does not include access to medical data.[14] This level was chosen because the patient interview was seen as an essential part of the project. Due to the specific setting in Belgium, a level 3 MR, in which clinical information is incorporated, was not feasible. Belgian community pharmacies do not yet have access and are not experienced in interpreting lab values. Furthermore, interprofessional collaboration is in their infancy, which complicates the exchange of this type of information. The feasibility study confirmed that the medication review type 2a was already considered innovative and challenging for the participating pharmacists. Therefore, the APB foresees a step-up approach for the implementation of MR in Belgium, in which this medication review type 2a is a first essential step.

The tested MR service included 6 steps: (1) patient inclusion (at the counter); (2) interview preparation based on the medication history, including searching for potential drug-drug interactions, side effects and available education materials for the drugs used by the patient; (3) first interview with the patient, including patient data collection (at the pharmacy in a private counselling area or at home); (4) pharmacotherapeutic analysis, including detection of DRPs, identification of needed interventions and treatment plan preparation; (5) second interview with the patient to discuss the proposed interventions and provide the treatment plan (in the pharmacy, at the counter or in a private area, or at home); and (6) follow-up interview (at the counter during the next patient visit to the pharmacy). Contact with the patient's physician was recommended for steps 2, 4 and 5 but was not compulsory.

It is important to note that for the pilot study, pharmacists were asked to include 12 patients during 2 defined half-days. The target sample of 12 patients per pharmacy was based on a sample size calculation for the effectiveness study. During the defined inclusion days, pharmacists had to propose the MR service to all eligible patients. Patients were eligible if they were $\geq$70 years, using $\geq$5 chronic medicines and living in an ambulatory setting. The full protocol of the project, including the development of this service and its description, the description of the educational program and the protocol of the impact evaluation, is described elsewhere.[19]

Description of the framework used to describe the implementation process

The implementation strategies developed for the pilot project are described through the defined stages of the framework for the implementation of services in pharmacy (FISpH).[9] The framework states that implementation is a complex multi-stage process involving an innovation (in this case the MR service to be implemented), a multi-level context (individuals, pharmacy(s), local setting and system), influenced by a range of factors, strategies, and evaluations (Fig. 1). This framework was chosen because it was based on a literature review of existing and largely used validated frameworks and adapted for the community pharmacy setting. For this study, we described the development of the intervention, the exploration, the preparation and the testing stages corresponding to the pilot study.

Assessment of implementation during the testing stage

Study design

A prospective observational study using a mixed method approach

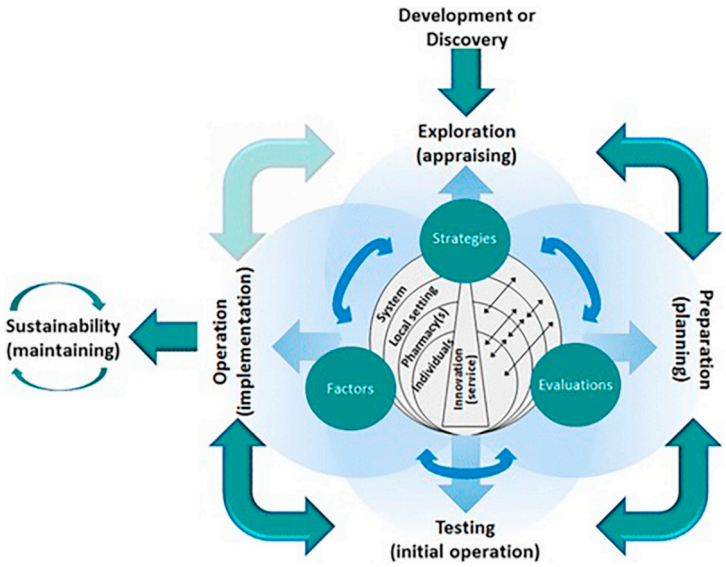

Fig. 1. Framework for the implementation of services in pharmacy developed by J. Moullin et al.[9].

(quantitative and qualitative analyses) was undertaken.

Participants

All pharmacies in Belgium were eligible to participate in the pilot project. For the qualitative analysis, community pharmacists participating in this pilot project were contacted by email and invited to participate to a focus group on a voluntary basis.

Collected outcomes

The implementation evaluation of the testing stage was based on the RE-AIM model. This implementation evaluation model defines five dimensions: reach, adoption, effectiveness, implementation and maintenance.[20] These dimensions, with the exception of the effectiveness, were evaluated with both quantitative and qualitative research methods. Quantitative data were defined to reflect as close as possible the RE-AIM dimensions in a pilot project context and qualitative data were defined to explore potential influencing factors of these dimensions. Collected outcomes were completed and enriched with the outcomes of the evaluation model related to the FISpH.[7] For this project, reach rate and maintenance were not appropriate as it was a pilot study intending to explore the impact and implementation of the MR service in Belgian community pharmacies. Outcomes were therefore adapted in measuring an acceptance rate instead of a reach rate and in exploring potential influencing factors for a future national implementation. Collected outcomes are described in Table 1.

Data collection

Quantitative data were collected through (1) the web platform designed for this pilot project, where pharmacists recorded the information collected during the patient interview; (2) an online questionnaire sent to all pharmacists in March 2017 to evaluate the "patient responsiveness" score[21]; and (3) an online survey sent to all participating pharmacists at the end of the project (June 2017). The online questionnaire for patient responsiveness used the scale developed by Moullin et al. The "patient responsiveness" scale was developed to be administered to pharmacists and represent their perspective based on two factors "participation and enthusiasm" of patients. The questionnaire contains 12 questions with a 5-point Likert scale format, where 1 = never; 2 = rarely; 3 = sometimes; 4 = often; and 5 = always. The scale was evaluated in terms of content validity, acceptability and internal consistency by Moullin et al.[21] In order to avoid missing data, all questions were mandatory. The end of project survey was used to collect required outcomes that were not available into the web platform. Questions were related to socio-demographic information of participating pharmacists and pharmacies, the number of MR proposals and refusals, and the pharmacists' opinions regarding the feasibility of the service in practice (open-ended and multi-choice questions).

Qualitative data were collected by two investigators (ML and CH) during semi-structured focus groups with participating pharmacists between February and April 2017. The interview guides, one for the focus group and one for drop-out pharmacists, were based on the defined implementation outcomes that were based on the RE-AIM. Pharmacists who did not include patients during the pilot project were also contacted and interviewed by phone by the investigators (ML or CH) to understand the reasons of non-inclusion. At the time of the study, ML, who conducted the French focus groups, was experienced with qualitative study and trained CH during the four French focus groups to conduct the last focus group with Dutch pharmacists.

Additional quantitative and qualitative information given by pharmacists during phone calls with local coaches of the local pharmacists' associations was added to the results. All materials (web platform, survey, patient responsiveness scale and interview guide) were translated both in French and Dutch. The patient responsiveness scale was translated following the ISPOR guidelines.[22]

Analysis of the results

Quantitative data were represented with the median and interquartile range for continuous variables for avoiding interference of potential outliers and with proportions for discrete variables.

For qualitative analysis, all focus groups were recorded and transcribed verbatim. Each pharmacist received a number in a separate file which was only available to the research team to ensure anonymity. The transcriptions were inductively coded by two independent investigators (ML/CDV for the French focus groups and CH/JM for the Dutch focus group). Codes defined by the two investigators were matched together and discordances were discussed. Interviews by phone were not recorded and directly coded by the interviewer. Codes were repeated at the end of the interview and confirmed by the interviewed pharmacist. Finally, codes were grouped into themes and classified regarding the explored outcomes. ML was trained and experienced in coding, CH was trained during the study, while CDV and JM had some knowledge of qualitative methods but both coded text for the first time.

Ethical approval

The study protocol for the implementation evaluation was submitted to the Erasme Hospital Ethics Committee (ULB, Belgium) in

Table 1
Description of collected outcomes classified into the four dimensions of the RE-AIM.

Dimension	Quantitative data	Qualitative data
Reach (*The absolute number, proportion, and representativeness of individuals who are willing to participate in a given initiative)*	- Acceptance rate = number of included patients divided by the number of potential patients (= inclusion/proposals*100)[a] - Number of refusals	- Reasons for refusal according to pharmacists - MR proposal and reach of the target population
Adoption (*The absolute number, proportion, and representativeness of settings and intervention agents who are willing to initiate a program)*[b]	Setting level: - Characteristics of pharmacies[c] - Number of pharmacy drop-outs during the study[d] Pharmacy level: - Characteristics of pharmacists[e]	- Reasons for adopting or rejecting the service
Implementation (*intervention agents' fidelity to the various elements of an intervention's protocol)*[f]	- Number of included patients per pharmacy - Number of first interviews delivered to patients - Number of second interviews delivered[g] - Number of provided interventions regarding the number of identified DRPs - Time needed for implementation[h] - Patient responsiveness score	- Internal organization and adaptations to the service process - Time needed to provide the service - Facilitators and barriers - Necessity of educational program and extra training needed - Interprofessional contact
Intent of maintenance	-Feasibility in practice	- Pharmacists' satisfaction with the MR service - Prospects and long-term support needed

Notes:
[a] As this was a pilot study, patient inclusion criteria were defined for the impact study; pharmacists were asked to define two inclusion days to propose the program to all patients who met the inclusion criteria and to include a maximum of twelve patients per pharmacy. For the implementation evaluation, we decided to use the number of patients to whom the MR service was proposed to quantify the number of inclusions compared to the number of refusals.
[b] The number of pharmacists aware of the MR service, needed to calculate the adoption rate (number of pharmacies that participated divided by the number that were aware of the project), could not be estimated as the information about the project was sent through national and local pharmaceutical magazines.
[c] Pharmacy language (Dutch or French), number of full-time equivalent pharmacists and technicians per pharmacy, location.
[d] A pharmacy was considered as a drop out if they did not record any patient in the web platform.
[e] Gender, age, number of years of experience in the pharmacy, previous experience with MR.
[f] In this project, fidelity or the extent to which a service is delivered as intended, was described in terms of the pharmacist's adherence to the MR service protocol (e.g. internal organization/service process; includes inclusion of the target patients as described in the protocol, detection of DRPs and proposition of interventions by pharmacists, and interprofessional contact), dose of the MR service delivered (number of delivered interviews and interval in between interviews), adaptation of the service process in practice, and patients' responsiveness to the MR service.
[g] Second and third interviews were recorded together in the web platform and therefore could not be treated separately.
[h] Time between the training (educational program) and the first patient included (measured by pharmacy and then presented with the median and interquartile range).

November 2016 and approved in December 2016 (P2016/529). Informed consent form was not required for the implementation evaluation as collected outcomes were related to pharmacy practice.

Results

Description of the implementation process

Strategies defined during each stage are described in Fig. 2.

During the exploration stage, 102 pharmacists from 72 pharmacies attended one of the information sessions. Finally, 80 pharmacies participated in the pilot project. Some of them had not been present during the information sessions but were aware of the project through articles in national and local pharmaceutical magazines. During the preparation phase, 101 pharmacists, from 64 out of the 80 participating pharmacies, participated in the 3-h workshop. All information regarding supporting materials was sent to pharmacists by email and available on the web platform specifically designed for the pilot project. During the testing stage, 34 pharmacists participated to the intermediate meeting, which was the opportunity for them to exchange their experience with the project and receive initial implementation feedback. The aim of the implementation feedback was to show the evolution of the implementation process in providing the number of participating pharmacies, the number of included patients compared to the target of 12 patients per pharmacy, and the number of first and second interviews delivered.

Assessment of implementation during the testing stage

Eighty pharmacies (36 from the French-speaking part and 44 from the Dutch-speaking part of Belgium) decided to participate; 25 dropped out before the end of the study (31%). At the conclusion of the testing stage, 5 focus groups were organized with 22 pharmacists from 20 participating pharmacies; 4 with French-speaking pharmacists (n = 16 pharmacists) and one with Dutch-speaking pharmacists (n = 6 pharmacists). Sixteen pharmacists were female, and the median number of years of experience of interviewed pharmacists was 16.2 years [IQR = 6.0–26.5]. The last focus group with Dutch-speaking pharmacists did not generate new information and confirmed data saturation. All themes and related transcribed sentences of the qualitative analysis are presented in the Additional file. For the patient responsiveness scale, 58 pharmacists (24 French and 34 Dutch-speaking pharmacists out of the 55 pharmacies remaining at the end of the study) answered the questionnaire. Finally, 67 pharmacists (from 42 pharmacies out of the 55 remaining pharmacies) completed the web survey sent in June 2017 (Fig. 3).

Reach

Pharmacists, from the 42 pharmacies that completed the web survey, proposed the program to 887 patients, of which 457 accepted to participate, resulting in an acceptance rate of 51.5%.

Reasons for refusal

The number of refusals varied across interviewed pharmacists. Some pharmacists experienced no refusals whereas others reported a high

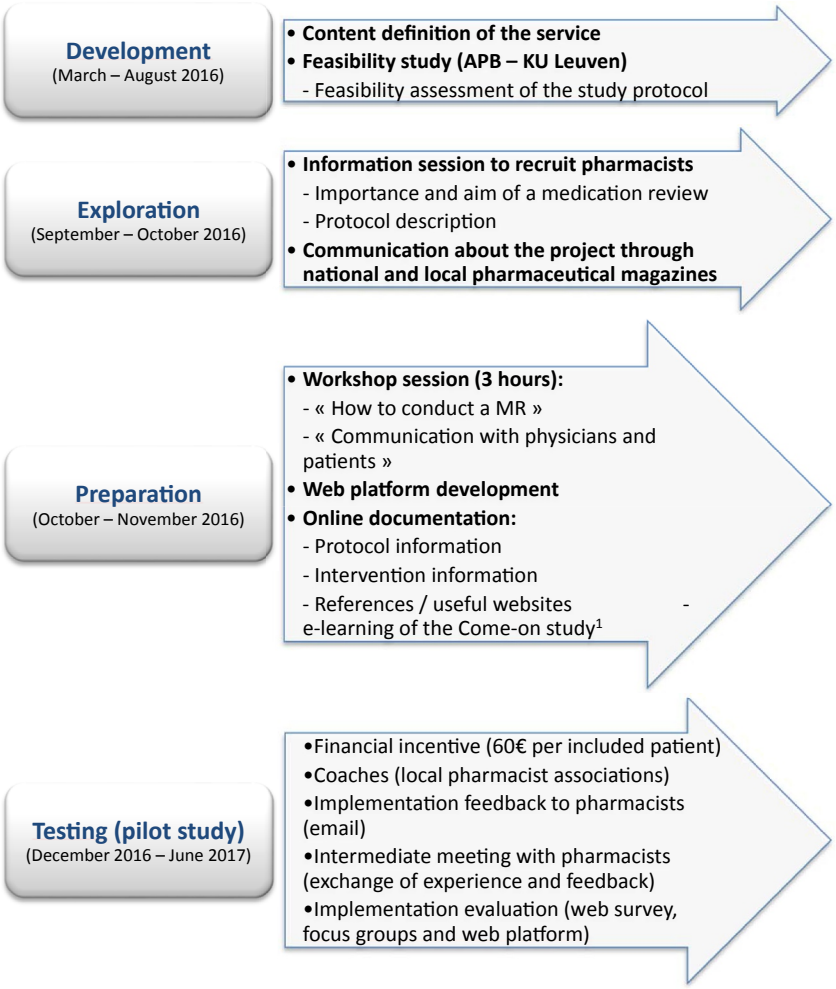

Fig. 2. Description of the implementation strategies developed through the development, exploration, preparation and testing stages.
Notes[1]: This e-learning was developed to support the implementation of a large national project on rational prescribing in nursing homes[2,3] and contains four training modules: 1) pharmacotherapy of elderly patients, 2) medication review: definition and contribution of each health care professional, 3) how to conduct a medication review with interprofessional collaboration, and 4) work as a team. The e-learning is available in both French and Dutch.

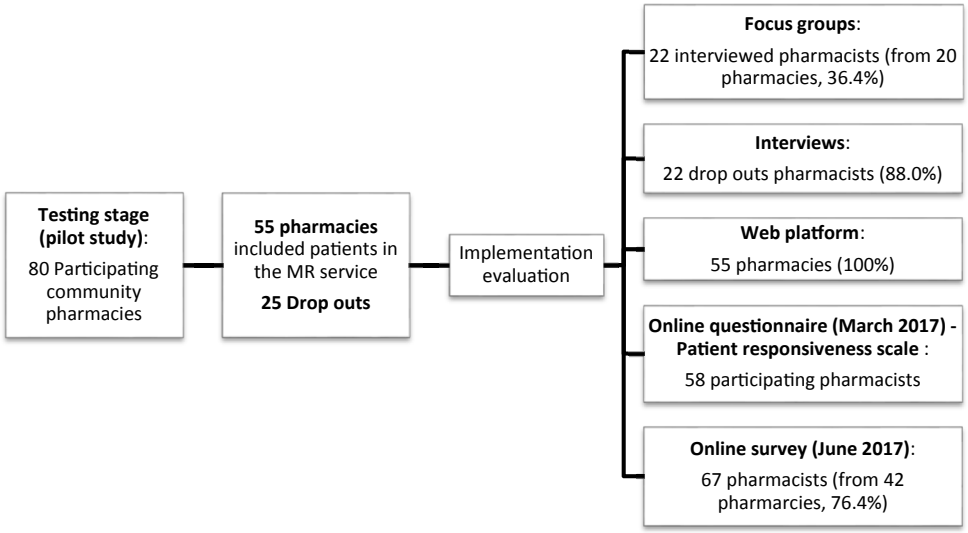

Fig. 3. Flow chart of the study population for the implementation evaluation.

level of refusals. Different reasons for refusals were expressed by pharmacists during focus groups and in the online survey. Patients mainly refused to participate because they declared that they did not need the service and were sufficiently autonomous to manage their treatment (online survey; 40.0% of refusals, n = 172/430).

Lack of time was also expressed as a reason for refusal (25.8%, n = 111/430). During focus groups, some pharmacists declared to have the feeling that patients, or family members, were not used to this kind of service and perceived it as an intrusion.

Patients also refused because they thought that it was not the role of the pharmacist (9.3%, n = 40/430). Moreover, pharmacists explained during focus groups that some concerns regarding the physician were expressed by patients. Patients had fears about the potential physician's reaction or because they trusted their physician regarding the prescription. Others refused because the added-value was not recognized by the physician him/herself.

Lastly, interviewed pharmacists indicated that some patients refused because they already had a medication scheme. Besides, pharmacists declared that the patients who would benefit the most were more difficult to convince and often refused to participate.

MR proposal and reach of the target population

Through the proposition of the MR service, pharmacists reported to have learned that highlighting the benefits of the service such as “detection of an interaction” and “improve your health” before talking about the study, facilitated the patient inclusion step. On the other hand, some pharmacists found it easier to present the study before talking about the benefits as some patients really like to participate in a study. Pharmacists reconsidered how best to propose the program over time depending on patients’ reactions. Pharmacists also stated that inclusion was easier when the patient was well-known by the pharmacist and when a trust relationship already existed.

In some situations, pharmacists refrained from proposing the MR service to patients with whom they had limited communication due to language differences, psychological troubles or limited intellectual quotient. Some pharmacists also refrained from proposing the MR service if the patient did not come to the pharmacy himself, and when a third party would need to be involved.

Adoption

Eighty pharmacies decided to participate in the pilot project. However, 25 pharmacies were considered as drop out because they did not include any patients (n = 20) or did not register interviews in the web platform (n = 5). Characteristics of participating pharmacies and pharmacists are presented in Table 2.

Reasons for adopting or rejecting the service

Pharmacists were motivated to integrate this new service in their practice because they all agreed that this kind of service is an integral part of the pharmacist's role and is an added-value for the patient. The pilot project was seen as an opportunity to show their added-value and change other health care professionals' and patients' attitude about the profession but also as an opportunity to develop interprofessional contacts.

Other motivations provided by pharmacists to participate in the pilot project included the opportunity to review their practice and to personalize the patient follow up, which created a trust relationship between the pharmacist and the patient.

There were different reasons for drop outs. First, the lack of time was evoked by pharmacists as the main barrier to integrate the service in their practice (n = 13). The heavy workload and the sense of urgency had led them prioritize other activities. Second, the lack of interest of patients, and therefore, the difficulty to include patients was mentioned as a reason for drop out (n = 5). Third, five pharmacists declared to have provided interviews but did not have the time to encode the data in the web platform. Lastly, three pharmacists started renovation works in their pharmacies and hence had no possibility to participate. Three pharmacists did not express any reason.

Table 2
Characteristics of pharmacies and pharmacists participating in the pilot project.

Pharmacies' characteristics	
Participating pharmacies (n)	80
Pharmacy language	
French pharmacies (%)	45.0%
Dutch pharmacies (%)	55.0%
Number of full-time equivalent in the pharmacy	
Pharmacists (median [IQR])	2 [1.2–3]
Technicians (median [IQR])	1 [0–2]
Pharmacists' characteristics	
Participating pharmacists (web survey) (n)	67
Status	
Associated pharmacist (%)	38.8%
Manager pharmacist (%)	61.2%
Age (median [IQR])	40 [33–48]
Sex	
Female (%)	74.6%
Male (%)	25.4%
Number of years of experience in pharmacy (median [IQR])	14 [7–20]
Previous experience with MR (trainings, participation in awareness campaign or in a previous study) (%)	73.1%

Note: IQR = interquartile range.

Implementation

The median time between the official date of the inclusion period of the study (1st December 2016) and the first patient inclusion by the pharmacy was 41 days [18–74]. According to the web survey, 42 pharmacies included in total 457 patients. In the web platform, 441 first interviews and 391 s interviews were registered by 55 pharmacies (representing on average 8 patients per pharmacy, which is lower than the 12 patients requested for the impact study). The interval between the first and the second interview was 42 days [4–98]. During the first interview, 1088 DRPs were recorded by pharmacists and at least one intervention was proposed for 1054 DRPs (preliminary data, analysis will follow in the article related to effectiveness of the service).

According to the pharmacists, patients responded positively to the MR service. The median patient responsiveness score was 3.5 out of 5 [IQR = 3.25–3.75], showing a higher score for participation (3.7 [3.4–3.9]) than for enthusiasm (3 [2.7–3.7]), which was mainly due to the low score for the item “patients request the service” (Appendix 1).

Internal organization and adaptations of the service process

Eight interviewed pharmacists used organizational strategies by integrating the entire team in the project, adjusting the human resource staffing during scheduled interview days or planning interview days for which more staff were available in the pharmacy. Pharmacists working alone in their pharmacy or pharmacists who did not acquire the support of their team, prepared and organized interviews after official opening hours of the pharmacy. On the other hand, some pharmacists preferred to prepare interviews at home to avoid being disturbed, but conducted interviews with patients during the pharmacy working hours.

The service process was adapted by pharmacists depending on the detected DRPs and the need to contact the physician. Some pharmacists already prepared the treatment plan and directly provided it at the end of the first interview, which can explain the difference between the number of first (n = 441) and second interviews (n = 391) delivered.

Some pharmacists found the inclusion criteria related to age was too restrictive and included younger patients outside of this study.

Pharmacists found it difficult to adhere to the protocol requirement of having a set inclusion day. Some pharmacists fully respected this

requirement whereas most had difficulties to include all patients who visited the pharmacy during the defined days. Reasons expressed by pharmacists were “too many people at the counter” as well as the other reasons that refrained them to propose the MR service, as previously explained.

Time needed for the service

The preparation of the first interview took between 30 min and 2 h depending on the number of chronic medicines. This time decreased with the pharmacist's experience acquired during the project. After some interviews, pharmacists were more comfortable with the tools and acquired a systematic method to prepare for the interviews. However, they considered that 30 min was the minimum time required.

The first interviews lasted between 20 min and 1 h, with a maximum of 2 h for some patients. The second interview, including the treatment plan delivery and the presentation of the proposed interventions, was shorter and took approximately 10–20 min. Finally, the follow-up interview lasted less than 5 min and was provided at the counter or by phone.

Barriers and facilitators

The biggest barrier for all pharmacists was the lack of time considering the heavy workload and the administrative burden of the pharmacy. This barrier was related to lack of staff directly related to lack of remuneration for this kind of service.

The lack of team adoption hindered some pharmacists to provide the service during opening hours.

The inadequate layout of the pharmacy and the lack of clinical information about the patient were less frequently expressed by pharmacists.

On the contrary, a large pharmacy team and the involvement of a motivated team in the project with an appropriate pharmacy layout/organization facilitated the implementation of the pilot project in some pharmacies.

Necessity of educational program and extra training needed

Pharmacists who participated to the workshop stated that it was useful to understand how to conduct a MR. The role playing performed by the organizers gave them ideas to introduce the project to patients and conduct interviews. Available online tools (interview guide and interaction detection tools) were also described as useful for pharmacists and helped them to provide the service.

However, the training needs depended on the personal experiences and knowledges of pharmacists. Some pharmacists expressed a need to have trainings about pharmacotherapy whereas others would prefer more extensive trainings about communication with patients and/or other health care professionals with interactive role playing. Surprisingly, some pharmacists expressed needs for trainings that were already available, such as a coach to help them in practice at the pharmacy or an e-learning platform.

Interprofessional contact

The contact with the patient's physician varied from one pharmacist to another. Most of the interviewed pharmacists had positive contacts with physicians but stated to have easier contact with younger physicians. Some pharmacists, who had previous negative experiences with physicians, were not at ease and did not contact the physician at all.

Contacting the physician is delicate for pharmacists. They often had a lot of apprehension before contacting the physician and prepared their communication thoroughly.

However, once a positive relationship was established, the pharmacist felt more respected by the physician. This new relationship also facilitated the collaboration between the pharmacist and the physician for other patients. As an example, one physician contacted a pharmacist again for information about a drug-drug interaction for another patient.

Intent of maintenance

According to the online survey, 41.8% of pharmacists thought that the MR service was feasible in practice and 50.7% thought that it was feasible but will require some adaptations and additional support for a large-scale implementation. Only 4.5% thought that the service was not applicable in practice (3.0% of pharmacists did not provide an answer). Pharmacists' were concerned about the time and training staff needed to deliver the service, remuneration, the administrative burden and the collaboration required with the patients’ physicians.

Satisfaction of pharmacists

Interviewed pharmacists were satisfied with the new MR service describing it as a professionally satisfying activity. For them, it was a stimulating, enriching and instructive project.

According to the interviewed pharmacists, included patients were also happy with the service and were open to the proposed interventions. However, even though pharmacists stated that the utility of the service was undeniable for patients, some pharmacists thought that the positive effect of the intervention decreased over time and that they needed to regularly repeat information to some patients. Therefore, they concluded that this service could be useful only if it is repeated over time.

Prospects and long-term support needed

Some pharmacists faced more barriers than they expected. For them, the service could be feasible in practice but requires adaptations. First, a broad-based media campaign for patients and physicians was seen as needed to increase awareness about the pharmacist's role, which would subsequently help them to propose the service and increase reach.

Second, reorganization of the internal workload was considered essential. According to the pharmacists, such reorganization would require resources such as additional staff and, therefore, requires a more appropriate remuneration system. Considering the current budgetary restriction at the national level, pharmacists thought that the remuneration of this kind of service would be complicated, which could hinder the future development of the pharmacist's role.

Lastly, adapted software could help pharmacists save time. The inclusion of tools and functionalities of the web platform into the pharmacy software would avoid transcribing patient information, save time preparing the first interview and generating the treatment plan. Moreover, an integrated platform in the software could support internal communication within the pharmacy team (pharmacy team information-sharing).

Discussion

The majority of the participating pharmacists were motivated to participate in this pilot project and considered the MR service as implementable in practice. However, the implementation was not without difficulties. The patient inclusion step was challenging for pharmacists, who experienced on average 50% refusal rates. While some pharmacists reconsidered the way they proposed the service, other discouraged pharmacists abandoned the project. Patients' refusal seems to suggest a lack of awareness of the pharmacist's role. A recent realistic review highlighted that patients are not aware about pharmacist services and do not know what kind of care may be expected. However, patients who understand pharmacy services or received one in the past are more likely to accept such a service.[24] In addition in this study, some patients, and some pharmacists, were reluctant due to the potential reaction of the physician. Some physicians did clearly show negative reactions with the proposed service. The interprofessional collaboration was variable, and contacts were still delicate for pharmacists. However, most of the pharmacists experienced positive collaboration with physicians and stated that younger physicians generally appeared to be more open to

the service, which is encouraging for the future. One hypothesis is that recently developed interprofessional workshops taught throughout university education are starting to change the physicians' attitudes regarding the pharmacist's role. As proposed by Rubio-Valera et al., the development of interprofessional workshops could be investigated in collaboration with the different health care associations to give pharmacists and physicians the opportunity to meet face-to-face and to discuss shared objectives.[25] In Belgium, meetings between pharmacists and physicians started to be organized concerning the prescribing behaviour ("Concertation medico-pharmaceutique") but – so far - do not concern new pharmaceutical services.[26] In addition, interviewed pharmacists suggested the development of broad-based media campaigns to increase the adoption of the service by other health care professionals and increase patients' awareness of the pharmacists' role.

Lack of time was an important barrier for most of the pharmacists. In this study, pharmacists explained that the lack of time, due to an intensive workload and the administrative burden, was directly related to a lack of staff, and therefore, the lack of remuneration could hinder pharmacists to employ more staff. Smaller participating pharmacies showed a lot of motivation in providing the service outside of official hours, but the pharmacists' capacity to deliver the service was more limited as they worked alone, which could hinder long-term implementation. As such, the first strategy suggested by interviewed pharmacists to overcome this barrier was to adapt the remuneration system and have it approved at the political level. For pharmacists, an adapted remuneration means that the time spent to deliver the service should be taken into account in the financial compensation (1.5–2 h per patient for a MR). For Noain et al., the implementation cost at the pharmacy level is represented at 75–95% of the time spent to deliver the service, followed by the initial implementation cost and finally the maintenance cost.[27] In this pilot project, pharmacists had received 60 euros per included patient, which was perceived as too low by pharmacists considering the time spent per patient (1.5–2 h). Moreover, they received it at the end of the study which could explain why remuneration was evoked as a barrier during focus groups. According to Houle et al., time-dependent fees were reimbursed at $93.60 per hour on average across the world, representing 60 euros per hour.[17]

Remuneration alone is not sufficient to implement a new service in practice.[28] Pharmacists also mentioned that the reorganization of the internal workload facilitated the integration in the routine activity but was partly hindered by the lack of adoption of the service by some staff members. Kaae et al. showed that the lack of adoption by some pharmacists, called the 'laggards' in accordance with Roger's theory,[29] was more due to a lack of self-efficacy than to a real lack of competencies. Both individual (e.g. offer individual trainings to laggards to recruit patients and provide the service) and collective (e.g. feedback, meetings between staff members) activities were described to overcome this barrier.[12] In this Belgian study, large pharmacies in which the project was conducted by the pharmacy owner were more proactive in implementing the service, integrating organizational strategies, and integrating the entire team in the project. Literature also propose a better integration of pharmacy technicians so that pharmacists could better focus on their clinical tasks.[30,31] Internal strategies, including the reorganization of the internal workload, were not straightforward for all pharmacists. Latif et al. suggested that the existing work obligations should be taken into account and that the organizational culture of the pharmacy (norms, values, and basic assumptions of a given organization including organizational direction) should be understood to provide adequate resourcing.[9,32] Additional trainings, e-learning or materials on how to integrate a new service in practice could be developed by postgraduate educational organizations or professional pharmacy associations to support pharmacists.

Another strategy to save time described by pharmacists is the development of an adapted pharmacy software integrating all available tools for the service (e.g. web platform, DRPs detection tool). In addition, software could help pharmacists detect eligible patients, remind the pharmacist, or calculate medication adherence automatically based on the medical history. Well-designed software could also facilitate internal communication between staff members on important patient information received at each visit and ensure a good follow up for patients. However, such a development requires collaboration between software developers, professional associations and researchers. With the same idea, pharmacists proposed to develop a common web-platform to facilitate the exchange of information between pharmacists and physicians and therefore overcome the lack of clinical data. In Belgium, an e-health plan is currently in development at the government level to facilitate information exchange between health care professionals but is not yet fully implemented.[33]

For this project, the training workshop was not followed by all participating pharmacists, but they were all informed about available resources by email. The training needs varied between pharmacists, and surprisingly, some pharmacists asked for resources that were already available, such as e-learning and coaches. These results indicate a less than optimal use of available resources that could be due to a lack of clear communication by pharmacists' associations, a lack of interest of pharmacists at the beginning of the pilot project, or a lack of anticipation from pharmacists regarding the implementation challenge.

During the study, some pharmacists adapted the MR service to fit with the needs of their patients and with their practice. As an example, one pharmacist gave the treatment plan at the end of the first interview and did not conduct a second interview if no DRP was detected and if the treatment plan did not require adaptation. This method allowed the pharmacist to satisfy the patient with a direct feedback and to save time for other patients or other activities. Adaptation is necessary for implementation and intervention flexibility is part of many implementation models. As long as the core parts of the service were kept, effectiveness should be maintained, but allows for integration into the unique context of each pharmacy.[34]

Finally, the development of a new service in the future political vision is important for its implementation on a larger scale and the service's maintenance on the long term.[35] In Belgium, the development of the MR service is part of the future political vision for community pharmacists. Discussion between pharmacist associations and policy makers resulted in March 2017 in a multiannual framework that grouped different political initiatives and defined a development path for community pharmacists.[36] This framework plans to progressively reform the remuneration of pharmaceutical care and to integrate the concept of the reference pharmacist. The latter was formally implemented in October 2017. With this new concept, the patient can select his reference pharmacist who has to register all provided drugs and health products in the patient pharmaceutical record and provide a validated treatment plan. The reference pharmacist has to contact (if necessary) other health care professionals who have a therapeutic link with the patient and to transfer them the validated treatment plan.[36] However, policy makers and associations should be aware that moving from a vision to legislation without an intermediate implementation stage of building capacity is not sufficient in practice.[5,37] In 2017, Seaton published a call for action for professional organizations to support pharmacists using dissemination and implementation science.[38] In this pilot project, professional associations and researchers worked together to explore the MR service as a next step for the reference pharmacist.

Strengths and limitations

This study was part of a pilot project aiming to implement the MR service in Belgian community pharmacies and is the first study investigating the implementation of a potential new MR service in Belgium. This approach is in full accordance with the new consensus to determine the needed strategies, according to the encountered barriers and facilitators, before implementation on a larger scale. This corresponds to the testing stage in the FISpH framework (Fig. 1).[9,39]

Both French and Dutch-speaking pharmacists were included in this pilot project from different regions. Moreover, a variety of methods were used to gather both quantitative data as well as insights in the facilitators and barriers for implementation. However, this was a pilot project which included the voluntary participation of the possibly higher motivated pharmacists and was therefore not representative of all Belgian pharmacists. Although drop out pharmacists were also interviewed, opinions of pharmacists who did not participate in the project were not collected. This implementation evaluation did not integrate the vision of physicians and patients. Patient satisfaction was however evaluated in the SIMENON study conducted by the research team of KU Leuven.[19] Concerning patient inclusion, the limitation of 12 inclusions per site may have overestimated the average duration of medication review as due to learning effect, time to complete a MR reduced with practice. However, there were no substantial impact of not achieving the 12 patients per site for the implementation study. Finally, further studies should evaluate the implementation progress and monitor implementation outcomes to provide suitable strategies over time regarding encountered barriers across different implementation stages and levels.

Conclusions

The MR service was implemented in 68% of participating pilot Belgian community pharmacies but would require adapted resources and supports for larger scale implementation. The development of some strategies is currently in progress in Belgium at the political level, such as the development of a more advanced legal basis to reinforce the role of the pharmacist, the future revision of the remuneration system for pharmaceutical care and an e-health platform. However, other strategies, such as continuous support (including interprofessional workshops, additional trainings and materials on how to integrate a new service in practice, local coaches and adapted software), should be considered and tested to ensure a successful implementation. The engagement of universities, professional associations, policy makers and health care professionals will be essential for the future development of this service and its implementation in practice.

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Conflicts of interest

None.

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Appendix A. Supplementary data

Supplementary data related to this article can be found at https://doi.org/10.1016/j.sapharm.2018.09.002.

Appendix 1
Themes developed during the qualitative analyses and associated sentences

Re-AIM	Outcomes	Themes	Sentences
Reach	Reasons for refusal according to pharmacists	Patient do not need the service and were sufficiently autonomous to manage their treatment	*“I explained [the service] to him and he said « no » nearly offended because he said « I absolutely do not need this, I was told once and I am sure to do well. You should rather talk to people who are bedridden at home and who do not know anything, who lose their head»” [Ph6]*
		Patients, or family members, were not used to this kind of service - intrusion	*“There I received a very clear refusal from the family saying « No, you don't need to intervene, we take care of our mom »” [Ph3]*
			“I think that it is also a refusal because they are not used to… they are a little bit surprised that we ask that to them, they don't know about what they might be getting into. So, without knowing, they are suspicious” [Ph20]
		Concerns regarding the physician	*“Many told me « yes, I will talk to my physician » and there is not a physician who supported the idea” [Ph17]*
			“One patient was quite particular, she made an appointment and then she came back by saying us « I read that [patient consent form], no way! Do not mess my physician with it »” [Ph19]
			“I had a dozen of patients that told me « It is the doctor who takes care of it and everything is fine, I don't need anything else »” [Ph22]
		Complex patients difficult to include	*“People who need it most are the ones that are the least easy to convince” [Ph14]*
			“We sense when things can be improved or facilitated and patients were reluctant, not wanting us to get involved in their fragility” [Ph22]

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Appendix 1 (*continued*)

Re-AIM	Outcomes	Themes	Sentences
	MR proposal and reach of the target population	Pharmacists reconsidered how best to propose the program over time depending on patients' reactions	*"I got a lot of refusals and I thought it was my fault because I did not find the right words, and then I thought a little bit about how I could do it. In fact, I first talked about the project and then I talk about the benefits for themselves and then there was almost no refusal" [Ph1]* *"They like it, when it is a university project … they are happy to participate, they feel useful" [Ph2]* *"me, it scared them… as soon as I spoke of project, they were afraid that there was an intrusion into their life" [Ph3]*
		Easier inclusion of well-known patients – trust relationship	*"I think that knowing the patient well for several years is something good … it is much better received when we know the patient well" [Ph18]*
		Refrained proposals	*"The language barrier, it is true that patients who did understand neither French nor English, no need even to try" [Ph17]* *"Someone who lives on the edge of psychiatry…. I am not ready for this kind of conversation…I think it wouldn't work out" [Ph16]* *"It is the son or daughter that comes, so we know already that we will need to go at home and that a third person needs to be there" [Ph22]*
Adoption	Reasons for adopting or rejecting the service	Integral part of the pharmacist's role	*"It is really our job, it is why we are in the pharmacy" [Ph4]* *"I think it is really the pharmacist's job, it is to follow patients, to review their medication" [Ph6]*
		Added-value for the patient	*"It offers an added value in the care that you can offer as a pharmacist to the patient" [Ph13]* *"I think that is going to allow to learn [to patients] more about medication use, the role of each medicine, for which pathology" [Ph17]*
		Opportunity to show the pharmacist's added-value	*"yes and the nurse too because they know much more than us about what is happening in patients' life … it was an opportunity to advance our profession a little, to change people's attitude about our profession" [Ph3]* *"It is interesting to enhance the value of our profession" [Ph20]*
		Opportunity to review their practice	*"It also allowed us to question ourselves enormously" [Ph1]*
		Create a trust relationship between the pharmacist and the patient	*"I really like this kind of personalized follow up … the patient will have more confidence in the pharmacist who helped him and will be better able to ask more questions, to come back to the pharmacist" [Ph18]*
		Opportunity to develop interprofessional contacts	*"It was an opportunity to open the discussion with the physician" [Ph2]*
Implementation	Internal organization and adaptations to the service process	Organizational strategies	*"We did a retro-planning, we had first adapted the work schedule to the pharmacy in order to have more people present [pharmacists and technicians] some days … so we decided that we will do the interviews that week, we will take 3 interviews every day … we had chosen two half-days to propose to patients to include them in the project, it was not necessary, in one half-day we had filled the calendar" [Ph19]*
		Preparation and organization of interviews after official opening hours	*"It is clearly after official hours that I did this project" [Ph3]* *"I confess to have prepared interviews after official hours … I did all my interviews during the day, when there were other people who can serve at the counter" [Ph5]*
		Treatment plan directly provided at the end of the first interview	*"I provided the treatment plan at the end of the first interview because, considering that we had discussed the pathologies, the dosages, I said to them « Would you like me to summarize everything on a treatment plan? » I took advantage as it was all fresh" [Ph9]*
		Inclusion of younger patients	*"I did other interviews but with patients who did not meet the inclusion criteria, younger people. In general, I find* (*continued on next page*)

Appendix 1 (*continued*)

Re-AIM	Outcomes	Themes	Sentences
			younger people much more receptive, people of 45 to 50 years who are polymedicated and have a lot of benzo's" [Ph3]
		Difficulties to adhere to the protocol requirement	*"It is not easy because there are other things that intervene, if there are many people in the pharmacy, it was not easy to do" [Ph3]*
			"I have a little bit selected … I proposed to a first person and I told myself I will have to start putting it in place and here it falls on this lady whom I appreciate and I thought to myself why not" [Ph18]
	Time needed for the service	Time decreased with the pharmacist's experience	*"The first is always very difficult, the second is better and the third, we already know the tools and it is much easier" [Ph1]*
			"Over time, a routine takes place … we do it, we get automatisms but we must effectively overcome this first obstacle" [Ph19]
	Facilitators and barriers	Lack of time (heavy workload and administrative burden) related to lack of staff	*"It is difficult to find a balance between family life and work. The financial side also because yes, indeed, if we could have more staff, it might be a little easier" [Ph3]*
			"It is not easy in the daily practice to say I will take half an hour and sometimes, I have to adapt my days" [Ph18]
		Lack of team adoption	*"It is true that when you feel less supported by the owner, you sometimes dare less … finally I dared not say "I'm leaving half an hour" so I was doing my research on noon time, it was evening, during the weekend, so all this is really consuming" [Ph17]*
		Inadequate pharmacy layout	*"I think there are very few pharmacies where there really is a confidential space" [Ph17]*
		Lack of clinical information	*"We do not have enough access to the patient's record, everything about liver failure, kidney failure and that is a barrier I think" [Ph2]*
	Necessity of educational program and extra training needed	Useful workshop and tools	*"Tools were useful" [Ph5]*
			"I found that they were very interesting [workshop] even for everyday practice, seeing how to motivate, talking with colleagues, I found it very interesting" [Ph17]
			"The workshop, I found it very good, it indicated direction on how to approach things etcetera" [Ph19]
	Interprofessional contact	Interprofessional contact varied from one pharmacist to another - Easier contact with younger physicians	*"I had spoken about the project to the physicians before talking to patients and the approach was very positive… finally, physicians were more demanding than patients … However, other physicians, they feel like if we stole their patients or their job … it is easier with younger [physicians], they are more demanding" [Ph3]*
			"I have been cooled by my first contact with a physician with whom I get along well and he completely dismantled me … so I figured how will I act for others and then I sent emails" [Ph9]
			"My colleague works a lot with younger physicians and she tells me that younger physicians, they are different, they understand that we need to work together" [Ph17]
		Apprehension before contacting the physician	*"I need to reflect a lot, depending on each physician, while I have very good contacts with them but I would be afraid to spoil it… somewhere yes, it is easy with the study because here we have the shield "we made a study" so I thought I was going to put forward it to help" [Ph6]*
			"It is necessary to use psychology every time and even in doing this, sometimes it is « I still know what I do! »" [Ph8]
		If positive contact → pharmacist felt more respected	*"I have the impression that they respect us more as well. Now, I know almost all the physicians because I phone regularly when there are drug-drug interactions, so they are used having me on the phone for these stuff" [Ph1]*

(*continued on next page*)

Appendix 1 (*continued*)

Re-AIM	Outcomes	Themes	Sentences
		New relationship that facilitated the collaboration between the pharmacist and the physician for other patients	*"Since I have spoken about this, I have a physician who calls me from time to time asking me « Could you look if I can prescribe this and that »" [Ph3]*
Intent of maintenance	Pharmacists' satisfaction with the MR service	Stimulating, enriching and instructive project	*"I find it beneficial for practice, it is stimulating" [Ph3]* *"The personal development, because I'm less tired of such a working day even if we had to intercalate sometimes someone on noon times, it is less sterile, it is exciting" [Ph6]* *"I found it very interesting because you learn a lot" [Ph11]*
		Intervention effectiveness decreased over time - need to regularly repeat information to some patients	*"I think that we think it has huge impact but if we have a feedback [from patients] in* 6 months*, the impact will already diminish" [Ph1]* *"I think it is good to review that again annually" [Ph14]* *"yes every half year or yearly, to give refreshment, yes I think too" [Ph13]*
	Prospects and long-term support needed	Increase awareness about the pharmacist's role	*"I think a communication [is needed] that not only comes from the pharmacist's side" [Ph3]* *"I believe that there is information to give to physicians to prove to them that the pharmacist can bring something to them" [Ph20]*
		Reorganization of the internal workload that require resources	*"We do not manage our time very well or have not yet found the right organization … it requires staff, it takes one person more" [Ph1]* *"I will continue to provide it, to propose if I see that the patient is demanding … I think it is really good that the pharmacist takes up his role, but it is true that waiting for a remuneration from the National Institute for Health and Disability Insurance, unfortunately, I think they will never have the budget" [Ph17]* *"Very interesting, rewarding for the pharmacist but unprofitable. I cannot imagine being able to do this without hiring a person" [Ph20]*
		Adapted software	*"If the software could already put all the drugs itself [in the medication scheme], show the interactions … I'm the one who manages this project and I think the software must adapt because there will be changes [for the patient] but if it is another pharmacist, if there is a change in staff [the software must inform the pharmacist]" [Ph1]*

Appendix 2
Patient responsiveness score (n = 58 pharmacists)

		Never [1], % (n)	Rarely [2], % (n)	Sometimes [3], % (n)	Often [4], % (n)	Always [5], % (n)	Total (median, IQR)
1	Patients request the service.	34.5% (20)	29.3% (17)	32.8% (19)	3.4% (2)	0	2 [1–3]
2	Patients are proactive in asking the pharmacist questions.	0	1.7% (1)	13.8% (8)	56.9% (33)	27.6% (16)	4 [4–5]
3	Through other people (e.g. patients' family, friends) I am aware that patients speak positively about the service.	10.4% (6)	17.2% (10)	31.0% (18)	41.4% (24)	0	3 [2–4]
	Enthusiasm	14.9% (26)	16.1% (28)	25.9% (45)	33.9% (59)	9.2% (16)	3 [2.7–3.7]
4	Patients provide information about all the medicines they use (e.g. medicine cabinet, list of medications).	0	8.6% (5)	48.3% (28)	37.9% (22)	5.2% (3)	3 [3–4]
5	Patients actively participate during meetings with the pharmacist.	0	5.2% (3)	18.9% (11)	75.9% (44)	0	4 [4-4]
6	Patients collaborate in deciding an action plan and prioritising the interventions.	1.7% (1)	17.2% (10)	27.6% (16)	53.5% (31)	0	4 [3–4]

(*continued on next page*)

Appendix 2 (*continued*)

		Never [1], % (n)	Rarely [2], % (n)	Sometimes [3], % (n)	Often [4], % (n)	Always [5], % (n)	Total (median, IQR)
7	Patients comply with the interventions proposed by the pharmacist.	0	1.7% (1)	12.1% (7)	86.2% (50)	0	4 [4-4]
8	When interventions are directed towards modifying a medication plan (change in medication, dose, schedule etc.), patients adhere to them.	0	1.7% (1)	32.8% (19)	65.5% (38)	0	4 [3–4]
9	When education is provided (e.g. use of medications, adherence, non-pharmacological advice etc.), patients adhere to the interventions.	0	1.7% (1)	17.2% (10)	81.1% (47)	0	4 [4-4]
10	Patients go to the doctor when referred by the pharmacist.	0	1.7% (1)	17.2% (10)	81.1% (47)	0	4 [4-4]
11	During the service, patients come to appointments scheduled by the pharmacist.	1.7% (1)	3.5% (2)	8.6% (5)	86.2% (50)	0	4 [4-4]
12	Patients keep the pharmacist informed of any changes in their medication or health status.	1.7% (1)	10.4% (6)	37.9% (22)	50.0% (29)	0	3.5 [3–4]
	Participation	0.6% (3)	5.7% (30)	24.5% (128)	68.6% (358)	0.6% (3)	3.7 [3.4–3.9]
TOTAL (median, IQR)		4.2% (29)	8.3% (58)	24.9% (173)	59.9% (417)	2.7% (19)	3.5 [3.25–3.75]

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